BOSS TU-12/ TU-12H SERVICE NOTES

CHROMATIC TUNER

Third Edition

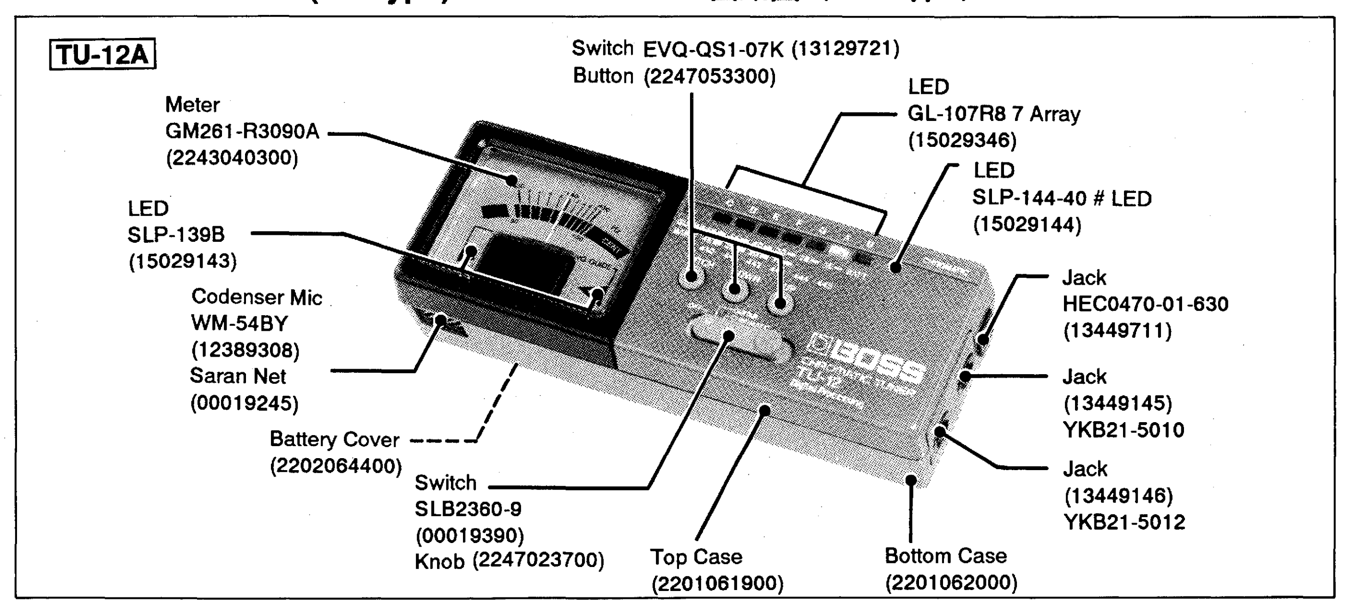
> **NOTE**
> Note that both TU-12A and TU-12 are marked "TU-12" on their panels.

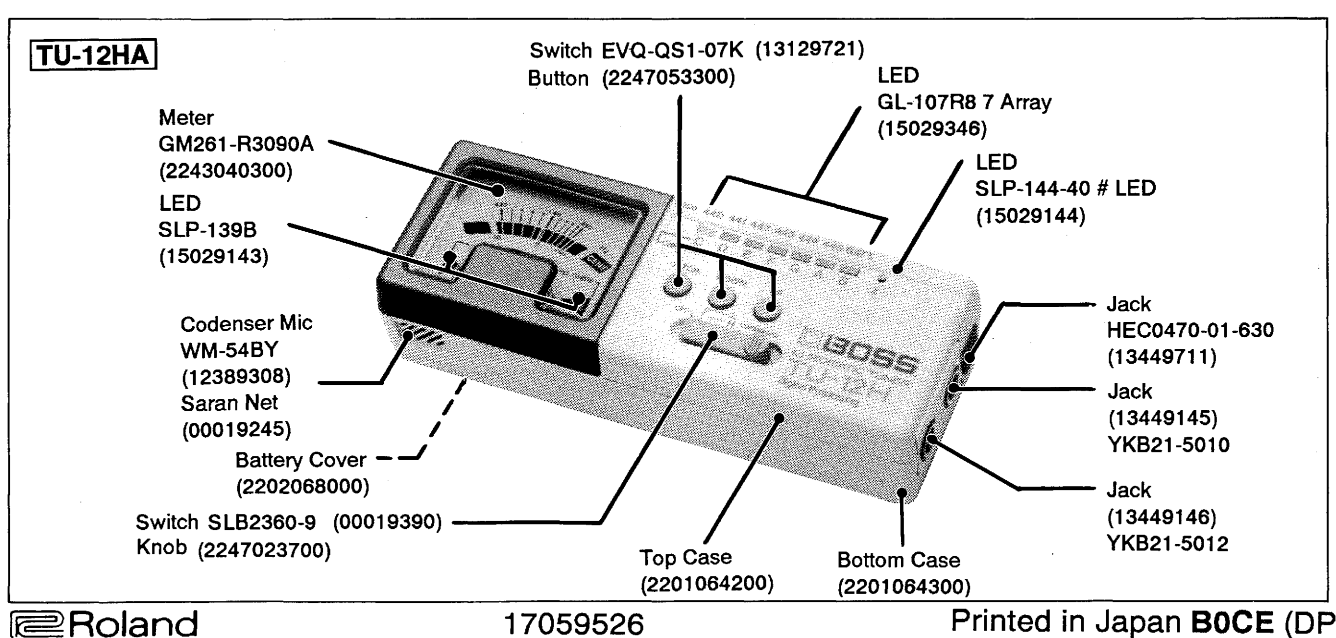
> **NOTE**
> TU-12A,TU-12 どちらもパネル面の表示は "TU-12" となっていますので、注意してください。

> **NOTE**
> Note that both TU-12HA and TU-12H are marked "TU-12H" on their panels.

> **NOTE**
> TU-12HA,TU-12H どちらもパネル面の表示は "TU-12H" となっていますので、注意してください。

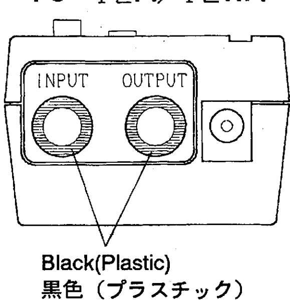
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How to distinguish between TU-12A/12HA(new) and TU-12/12H(old)

TU-12A/12HA(新バージョン)と TU-12/12H(旧バージョン)の見分け方



TU-12/12H
INPUT OUTPUT
Silver(Metal)
銀色（金属）

(Fig.A)

To distinguish between TU-12A/HA(new) and TU-12/12H(old), see the INPUT or OUTPUT jack(Fig.A) and check the serial number(Table.1).
If the jack is silver(Metal), it must be TU-12/12H(old type).
If the jack is black(plastic), it must be TU-12A/12HA(new type).

TU-12A/12HA(新バージョン)とTU-12/12H(旧バージョン)を見分ける為に、「INPUT」(又は「OUTPUT」)ジャックを見て下さい。(Fig.A 参照)
もし、ジャックが銀色(金属)なら、TU-12/12H(旧バージョン)です。
もし、ジャックが黒色(プラスチック)なら、TU-12A/12HA(新バージョン)です。
又、シリアル・ナンバーからも新旧バージョンを確認することができます。(Table.1 参照)

Differnce Between TU-12A/12HA(new) and TU-12/12H(old)

TU-12A/12HA(新バージョン)と TU-12/12H(旧バージョン)の違い

(Table.1)

	TU-12A/12HA (NEW)	TU-12/12H (OLD)
Serial No.	QE97100-up (TU-12A)	Prior to QE97100 (TU-12)
	DF05250-up (TU-12HA)	Prior to DF05250 (TU-12H)
PCB Assy No.	7843751000 (TU-12A)	79306530 (TU-12)
	7843851000 (TU-12HA)	79307510 (TU-12H)

SPECIFICATIONS/仕様 (new type)

- **Controls** ······: Power/Mode Selection Switch, PITCH Button, DOWN Button, UP Button
- **Indicators** ······: NOTE Name/PITCH Indicator, Meter Tuning Guide Indicators
- **Jacks** ······: Input Jack, Output Jack, AC Adaptor Jack
- **Input Impedance** ······: 1M Ω
- **Standard Pitch** ······: 440Hz to 445Hz 1Hz step
- **Tuning Range** ······: TU－12 :C1 (32.70Hz) to B5 (987.77Hz)
  TU-12H :C1 (32.70Hz) to B6 (1975.53Hz)
- **Tuning Accuracy** ······: ±1 cent
- **Power Supply** ······: DC9V : Dry Battery(9V type)
  AC Adaptor(PSA－Series : option)
- **Current Draw** ······: 20mA (DC9V)MAX
- **Dimensions** ······: 137(W) × 53(D) × 35(H)mm
  5－3/8(W) × 2－1/16(D) × 1－3/8(H)inches
- **Weight** ······: 170 g / 6 oz
- **Accessories** ······: TU-12A Soft Case (22010740)
  TU-12HA Soft Case (22010738)
  Dry Battery(9V type) (12569103RT)
  TU-12A Owner's Manual(English) (2602080200)
  TU-12A Owner's Manual(Japanese) (2602080100)
  TU-12HA Owner's Manual(English) (2602081200)
  TU-12HA Owner's Manual(Japanese) (2602081100)
  TU-12HA Syakuhachi Manual(Japanese Only) (26020814)
  TU-12HA Koto and Syamisen Manual(Japanese Only) (26020813)
- **Options** ······: AC Adaptor;PSA－100,PSA－120,PSA－220,PSA－240
  Dry Battery;S－006P/9V(6F22/9V),6AM6/9V(alkaline)

METER ADJUSTMENNT

1. While holding down PITCH, switch the unit ON.
   The unit enters test mode.
2. Adjust CR1 so that the pointer stays in the 0 cent (center of the meter face).
3. Switch the unit OFF to exit the test mode.

メーター調整

1. PITCHを押しながら電源を入れる。
   (テスト・モードに入る。)
2. CR1を調整して指針をゼロセント(目盛中央)に合わせる。
3. 終了すれば電源を切りテスト・モードから出る。

PARTS LIST/パーツリスト (TU-12A/TU-12HA)

SAFETY PRECAUTIONS:
The parts marked ⚠ have safety-related characteristics. Use only listed parts for replacement.

安全上の注意：
⚠が付いている部品は、安全上特別な規格でつくられたものです。
交換の際は、指定された部品番号以外の部品は使わないようにして下さい。

CONSIDERATIONS ON PARTS ORDERING

When ordering any parts listed in the parts list, please specify the following items in the order sheet.

	QTY	PART NUMBER	DESCRIPTION	MODEL NUMBER
Ex.	10	22575241	Sharp key	C-20/50
	15	2247017300	Knob (orange)	DAC-15D

Failure to completely fill the above items with correct number and description will result in delayed or even undelivered replacement.

パーツ発注に関するお願い

オーダーシートには、必ず下記の４項目は正確に記入して下さい。(例外は除く)

	必要数	パーツナンバー	品名	使用機種
例)	10	22575241	Sharp key	C-20/50
	15	2247017300	Knob (orange)	DAC-15D

もし記入漏れ、誤記等が有る場合、必要部品が発送できなかったり、大幅な遅れの原因になります。御協力をお願いします。

PANEL,CASING/パネル、ケース

2201061900	TU-12A	Top Case	Gray
2201062000	TU-12A	Bottom Case	Gray
2202064400	TU-12A	Battery Cover	Gray
2201064200	TU-12HA	Top Case	White
2201064300	TU-12HA	Bottom Case	White
2202068000	TU-12HA	Battery Cover	White

PCB ASSY/基板完成品

7843751000 TU-12A MAIN Board
NOTE: MAIN Board does not include Meter.
注意 ：補修用MAIN基板はメーターを含みません。
NOTE : Replacement MAIN Board includes SW Board
注意 ：補修用MAIN基板はSW基板を含みます。

7843851000 TU-12HA MAIN Board
NOTE : MAIN Board does not include Meter.
注意 ：補修用MAIN基板はメーターを含みません。
NOTE : Replacement MAIN Board includes SW Board
注意 ：補修用MAIN基板はSW基板を含みます。

KNOB,BUTTON/ツマミ、ボタン

2247023700	Slide Switch Knob	POWER／MODE SW
2247053300	Tact Switch Knob	PITCH SW, DOWN SW, UP SW

SWITCH/スイッチ

00019390	SLB2360-9	POWER／MODE SW
13129721	EVQ-QS1-07K	PITCH SW, DOWN SW, UP SW

JACK,SOCKET/ジャック、ソケット

13449711	HEC0470-01-630	Adaptor Jack
13449146	YKB21-5012	INPUT
13449145	YKB21-5010	OUTPUT

POTENTIOMETER/ボリューム

00019312	EVM-38GA00B23	Trimmer 2kB

DISPLAY UNIT/ディスプレイユニット

2243040300	Meter

IC

00019367	SC412237FU	Mask CPU	IC1
15189251	M5218AP	OP AMP	IC4
00019412	S-81250HG-Z	REGULATOR	IC2
00019467	S-80728AN-Z	Battery Level Detector	IC3

DIODE,LED/ダイオード、LED

15029346	GL-107R8	7 Array LED, LED1-7
15029144	SLP-144-40	# LED, LED8
15029143	SLP-139B	TUNING GUIDE LED, LED9, LED10
15019125	1SS-133	D2, D3
00019356	1SR139-100-T-32	

CRYSTAL/クリスタル

15299216	DSMAT310 4MHz	Xtal

RESISTER/抵抗

00120012	CRB20T36EFX9763	(metal film)	976k	R17
00120023	CRB20T36EFX4753	(metal film)	475k	R18
00120034	CRB20T36EFX2403	(metal film)	240k	R19
00120045	CRB20T36EFX1203	(metal film)	120k	R20
00120056	CRB20T36EFX6042	(metal film)	60.4k	R21
00120067	CRB20T36EFX3002	(metal film)	30k	R22
00120078	CRB20T36EFX1502	(metal film)	15k	R23
00120101	CRB20T24EFX5102	(metal film)	51k	R26
00120089	CRB20T36EFX4702	(metal film)	47k	R27

WIRING/ワイヤリング

00019256	MAJ-5X26-94-3	CONNECT MAIN Board with SW Board

MISCELLANEOUS/その他

12389308	Codenser Mic WM-54BY	
00019223	LED Holder A	For NOTE／PITCH LED
00019201	LED Holder B	For # LED
00019212	LED Holder C	For TUNING GUIDE LED
00019234	LED Spacer	For # LED
2341741401	Battery Connector	
22230568	Battery Cushion	
00019245	Saran Net	For MIC.
00120001	Plate	For POWER／MODE SW Knob, Orange

ACCESSORIES/付属品

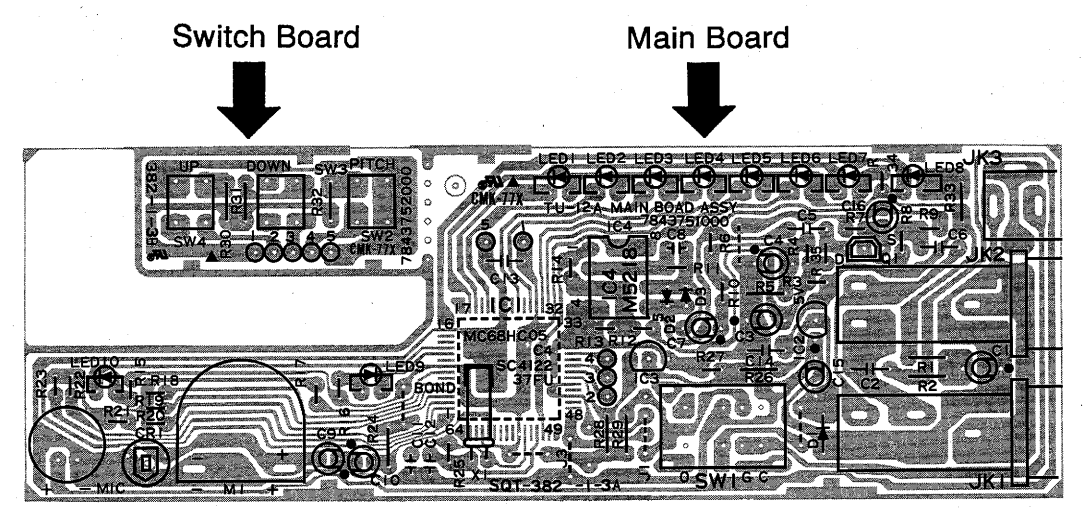
22010740	TU-12A Soft Case	Black
22010738	TU-12HA Soft Case	Beige
12569103RT	Dry Battery (9V type)	
2602080200	TU-12A Owner's Manual (English)	
2602080100	TU-12A Owner's Manual (Japanese)	
2602081200	TU-12HA Owner's Manual (English)	
2602081100	TU-12HA Owner's Manual (Japanese)	
26020814	TU-12HA Syakuhachi Manual (Japanese Only)	
26020813	TU-12HA Koto and Syamisen Manual (Japanese Only)	

【TU-12A】
MAIN BOARD
ASSY 7843751000

NOTE
MAIN Board does not include Meter.
補修用MAIN基板はメーターを含みません。

【TU-12HA】
MAIN BOARD
ASSY 7843851000

NOTE
Replacement MAIN Board includes SW Board
補修用MAIN基板はSW基板を含みます。



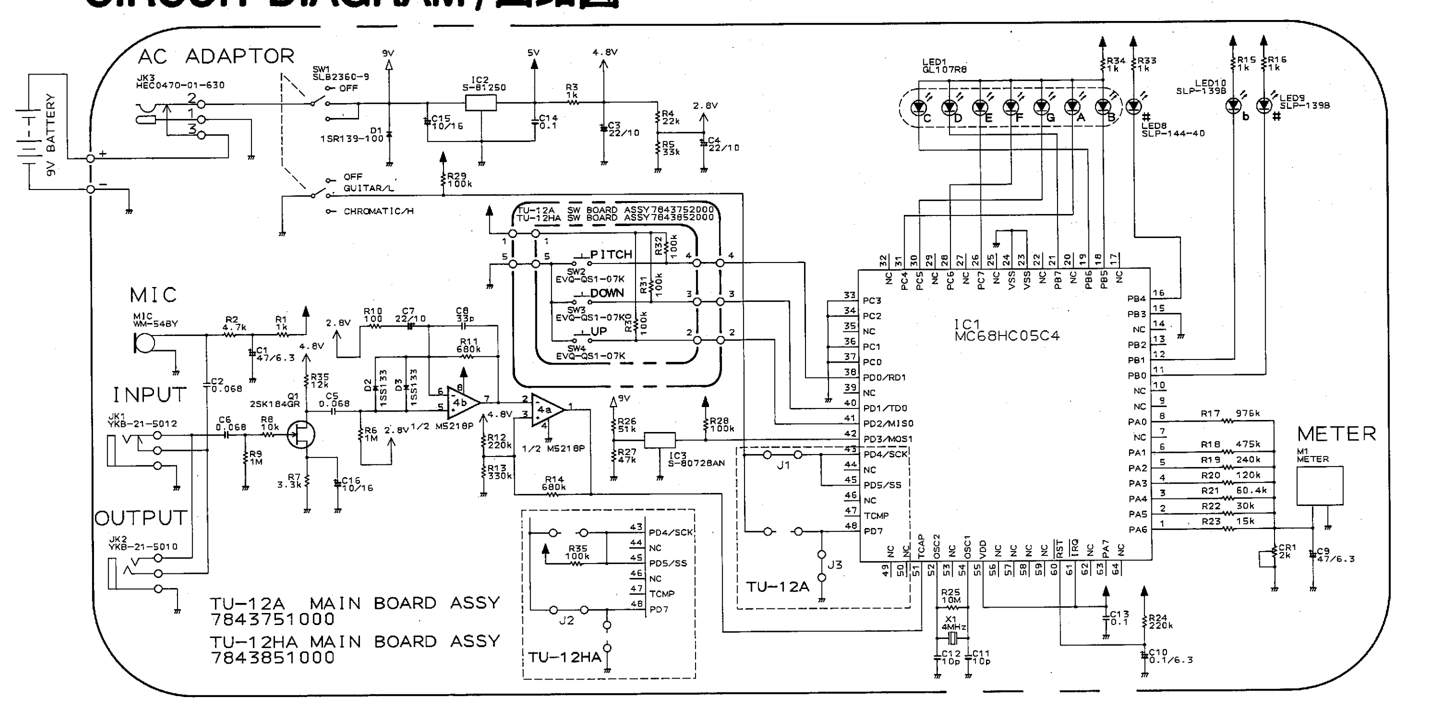
View from component side.

Difference Between TU-12HA PCB and TU-12HA PCB

TU-12A PCB と TU-12HA PCB の違い

	TU-12A	TU-12HA
Jumper 1	○	Nothing
Jumper 2	Nothing	○
Jumper 3	○	Nothing
Resistor 35 (100 Ω)	Nothing	○

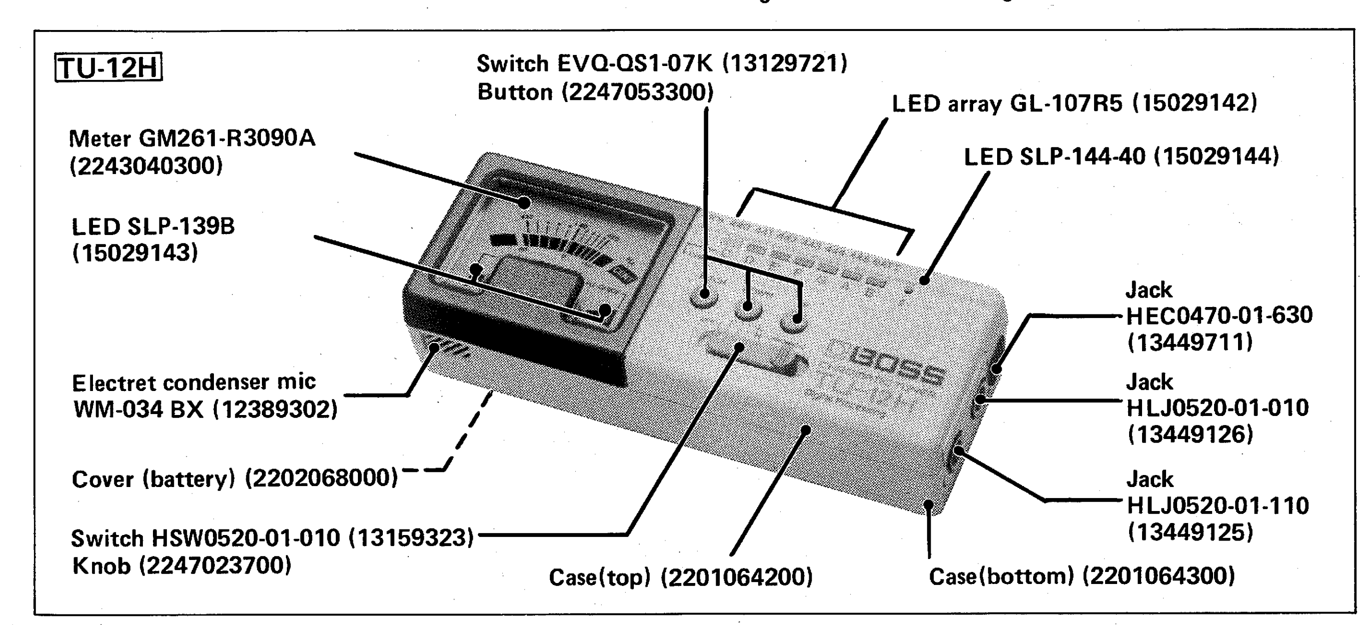
CIRCUIT DIAGRAM /回路図



BOSS TU-12H SERVICE NOTES *First Edition*

SPECIFICATIONS

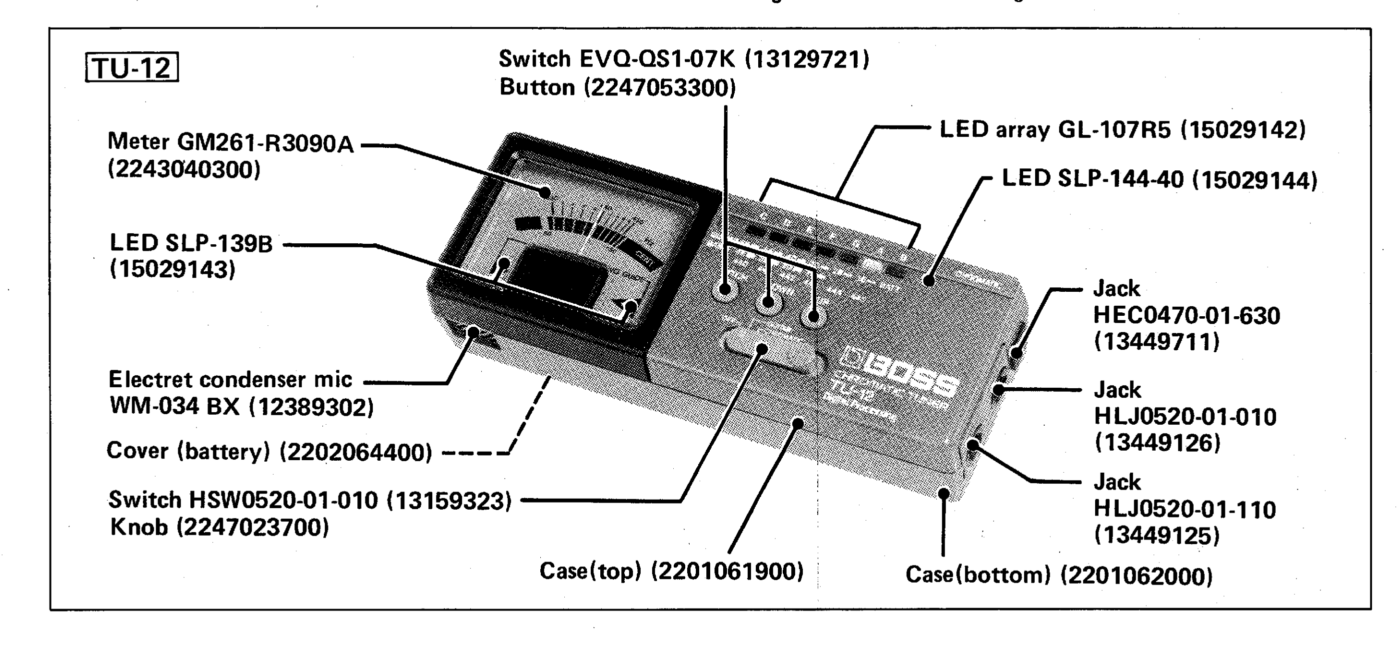
Power Consumption : 9V DC @ 20mA
Tuning Range : C_1 (32.70Hz) to B_6 (1975.53Hz)
Accuracy : ±1 cent
Master Oscillator : Quartz (3.579545MHz)
Standard Pitch : 440 to 445Hz 1Hz steps
Dimensions : 145(W) x 35(H) x 53(D)mm
5-7/16 x 1-3/8 x 2-1/16 in
Weight : 170g 6 oz



TU-12 *Second Edition*

SPECIFICATIONS

Power Consumption : 9V DC @ 20mA
Tuning Range : C_1 (32.70Hz) to B_5 (987.77Hz)
Accuracy : ±1 cent
Master Oscillator : Quartz (3.579545MHz)
Standard Pitch : 440 to 445Hz 1Hz steps
Dimensions : 145(W) x 35(H) x 53(D)mm
5-7/16 x 1-3/8 x 2-1/16 in
Weight : 170g 6 oz



PARTS LIST

2201064200	Case	(top)	TU-12H
2201064300	Case	(bottom)	TU-12H
2202068000	Cover	(battery)	TU-12H
2201061900	Case	(top)	TU-12
2201062000	Case	(bottom)	TU-12
2202064400	Cover	(battery)	TU-12
2247023700	Knob	(power)	
2247053300	Button	(PITCH, DOWN, UP)	
2341041400	Battery snap 1007#24		

JACK

13449125	HLJ0520-01-110	(INPUT)
13449126	HLJ0520-01-010	(OUTPUT)
13449711	HEC0470-01-630	(AC adaptor)

SWITCH

13159323	HSW0520-01-010	slide (power)
13129721	EVQ-QS1-07K	light touch (PITCH, DOWN, UP)

PCB

79306530	MAIN BOARD	(pcb 2291057704) TU-12
79306540	SWITCH BOARD	(pcb 2291057704) TU-12
79307510	MAIN BOARD	(pcb 2291088802) TU-12H
79307520	SWITCH BOARD	(pcb 2291088802) TU-12H

TRIMMER

13299151	H0651A009 2.2kB

ELECTRET CONDENSER MIC

12389302	WM-034BX

CRYSTAL

12389712	3.579545MHz

METER

2243040300	GM261-R3090A	(w/o cushion)
2226033300	Cushion	(TU-12 meter)

IC

15179140	MBR1012-523	CPU	
15219126	LC7900	Generator/Divider	
15189151	LA6458S or 4558S OP Amp, SIP 9P		
15229809	BA634		TU-12H

DIODE

15019209T0	S5500G		
15019303	RD5.6JB2 SN up to 294000	(zener)	TU-12
15019304	RD6.2JB2 SN304100 and up	(zener)	TU-12
15019305	RD6.8JB2 SN 304100 and up TU-12	(zener)	
15019128	MA27WB SN 304100 and up TU-12	(varistor)	
15019306	RD7.5JB2	(zener)	TU-12H
15019302	RD5.1JB2	(zener)	TU-12H

LED

15029142	GL-107R5	(red, 7-array LED)
15029144	SLP-144-40	(red)
15029143	SLP-139B	(red, TUNING GUIDE)

RESISTOR

13789114D0	CRB25DY	7.68k	0.5%	(metal film)
13769262D0	CRB25FX	125k	1%	(metal film)
13729490D0	ELR-25G	250k	2%	(vertical mount)
13719491D0	ELR-25J	500k	5%	(vertical mount)

TRANSISTOR

15129108	2SC945-P (or 15129114 2SC1815-GR)	
15139116	2SK118-O	(FET)

OTHERS

2225020200	Shield Plate

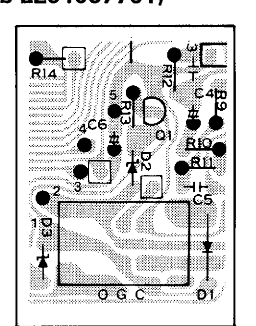
CHANGES ON TU-12 MAIN BOARD

D8, C13 and Q4 are added in later versions for improvement.
Upward compatible change, later versions can be a substitutive for predecessor(s).

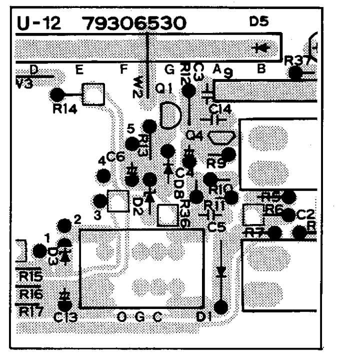
MAIN BOARD 79306530

SN up to 294000
MAIN BOARD 79306510
(pcb 2291057701)

SN 304100—390895
(pcb 2291057702)



SN 390896—up
(pcb 2291057704)

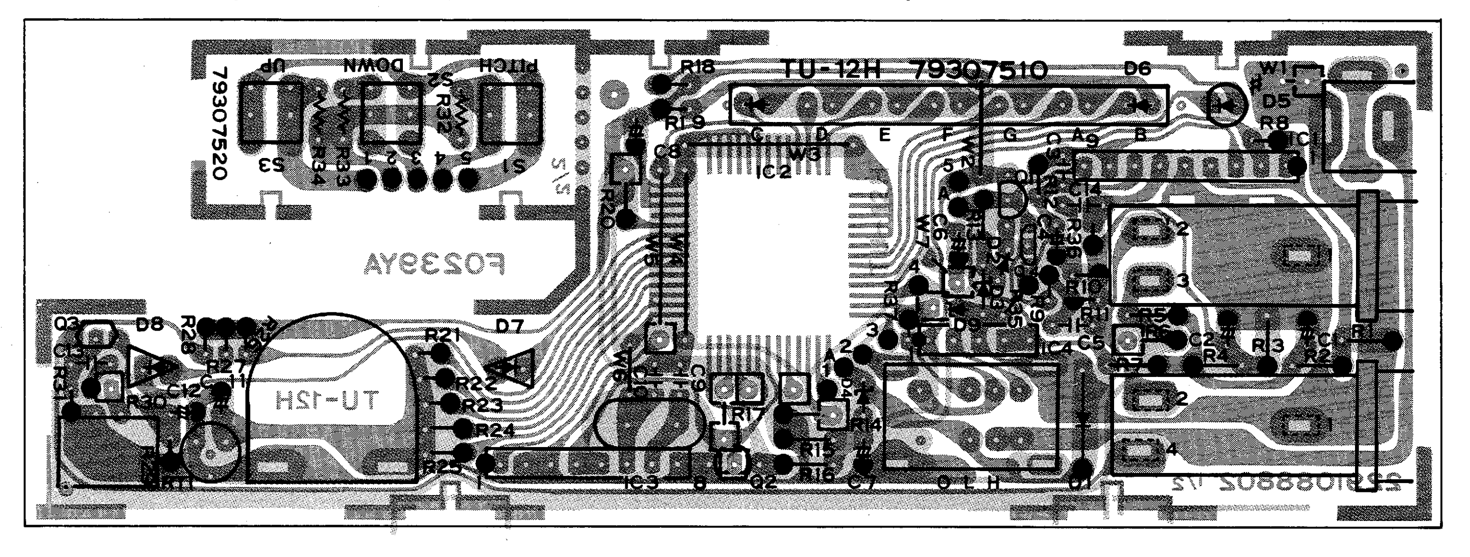


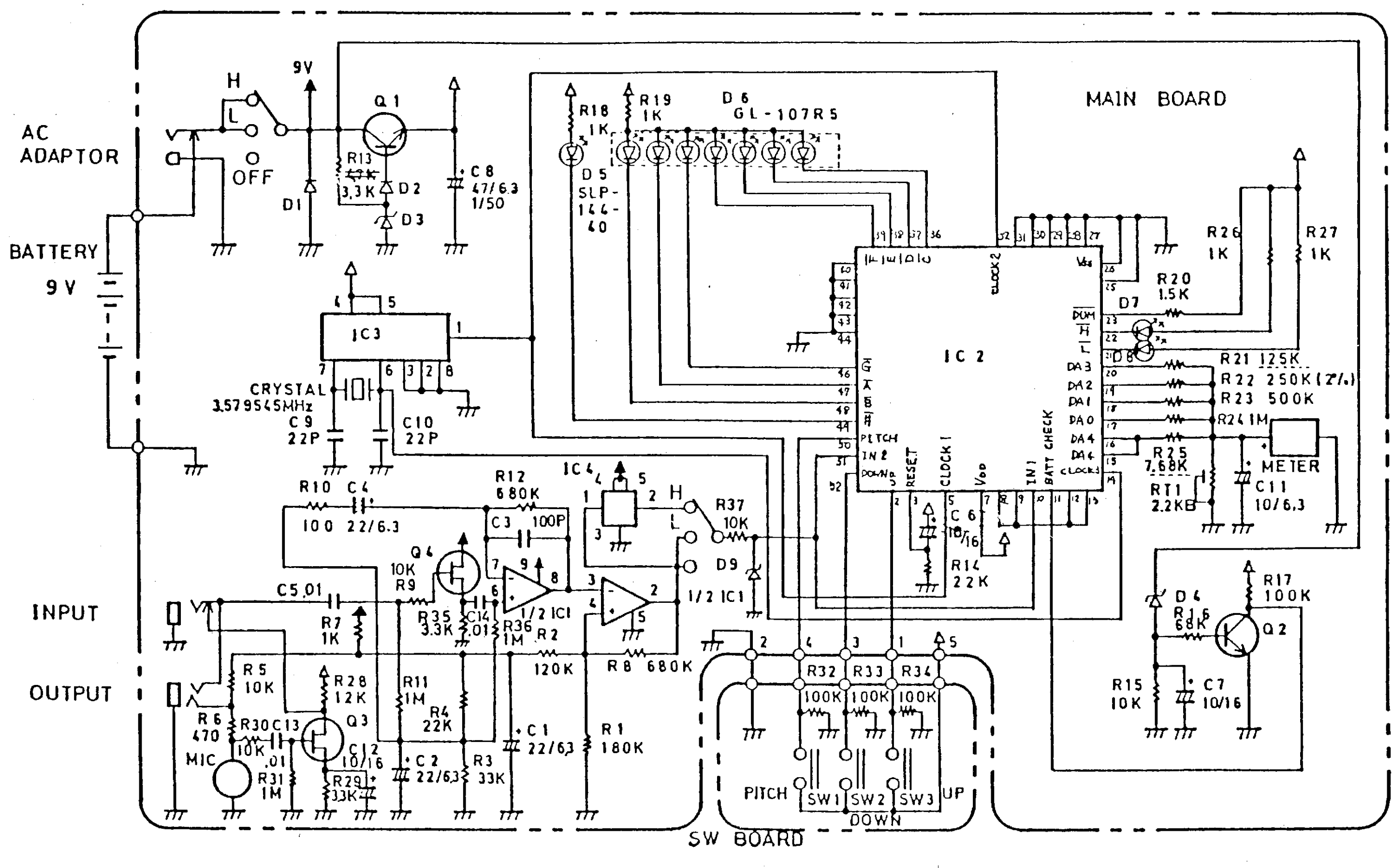
TU-12H

METER CALIBRATION
CAUTION: KEEP PITCH SWITCH ON DURING ADJUSTMENT, OR TU-12H ENTERS NORMAL MODE.
While pushing PITCH, turn power ON (L or H).
Adjust RT1 for 440Hz.

SWITCH BOARD
79307520
(pcb 2291088802)

MAIN BOARD
79307510
(pcb 2291088802)





D1 : S5500G
D2 : MA27WB
D3 : RD7.5JB2
D4 : RD6.8JB2
D7,8 : SLP-139B
D9 : RD5.1JB2
Q1,2 : 2SC945-P
Q3,4 : 2SK118-O
IC1 : LA6458S
IC2 : MBR1012-523
IC3 : LC7900
IC4 : BA634

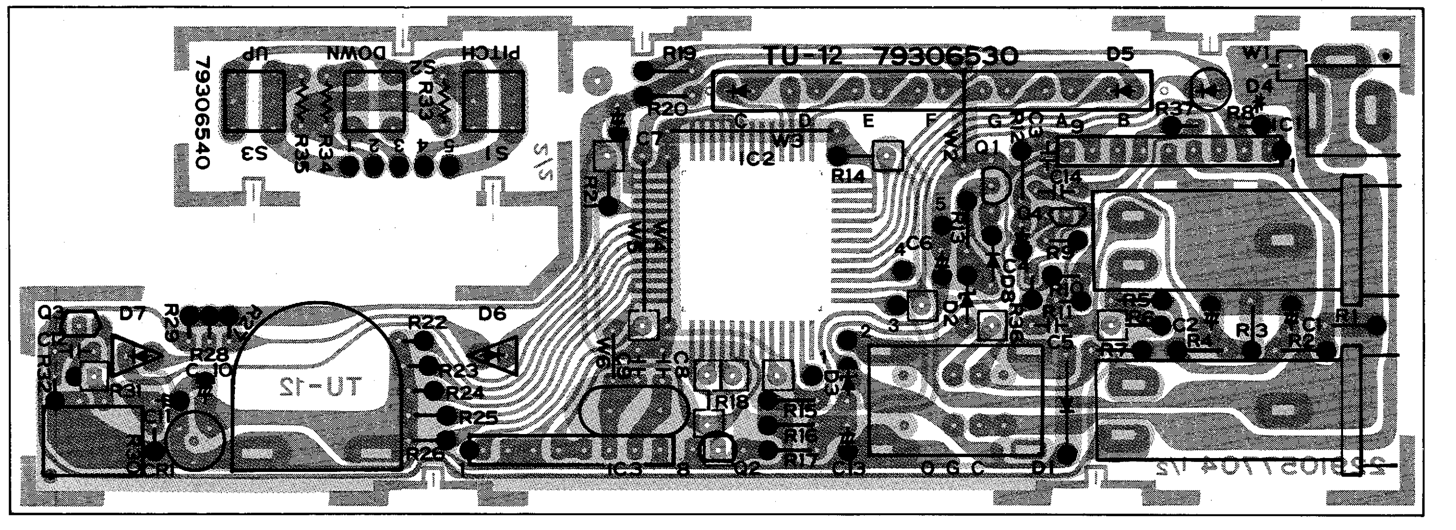
TU-12

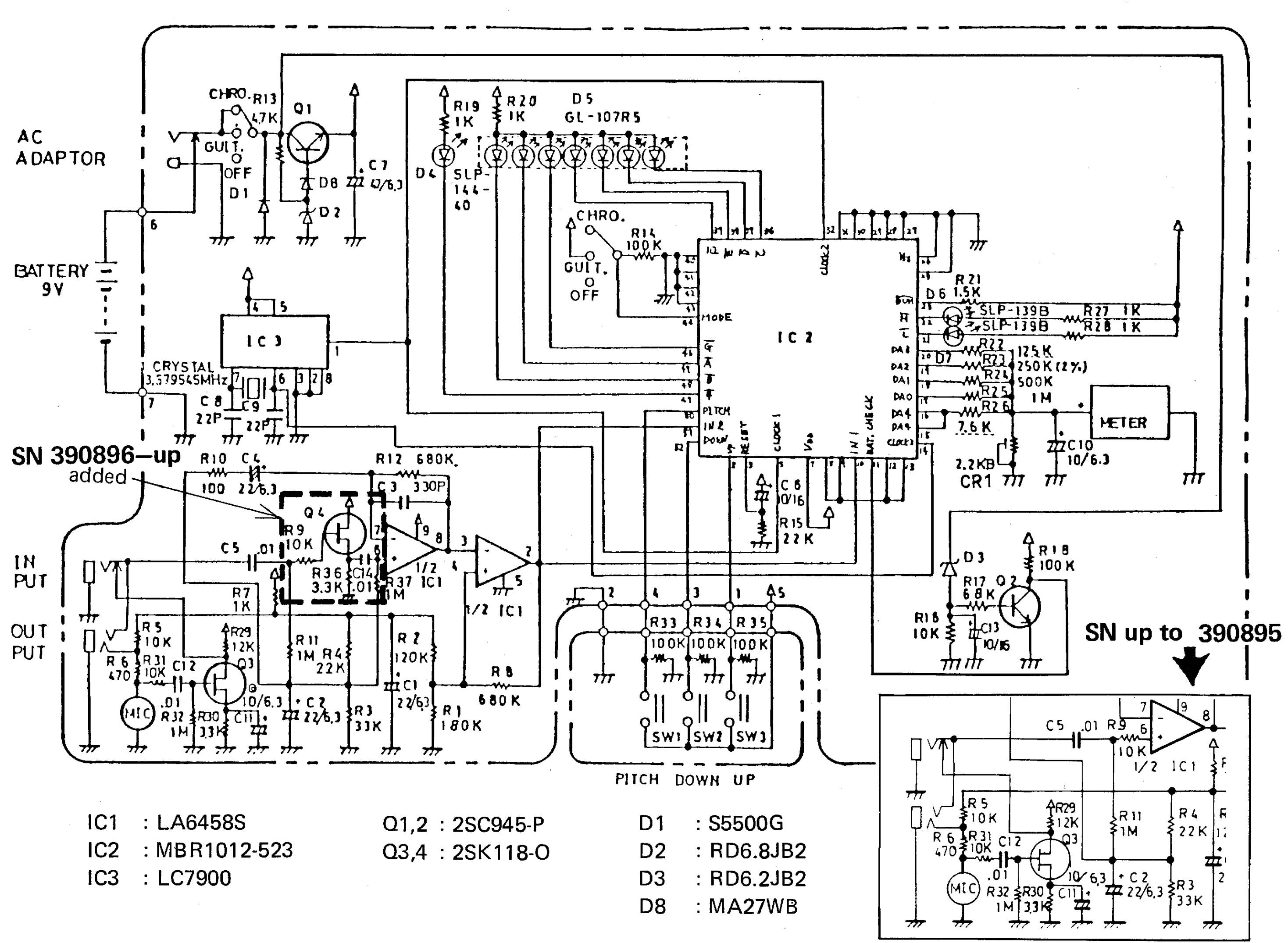
METER CALIBRATION
CAUTION: KEEP PITCH SWITCH ON DURING ADJUSTMENT, OR TU-12 ENTERS NORMAL MODE.
While pushing PITCH, turn power ON (GUITAR or CHROMATIC).
Adjust CR1 for 440Hz.

SWITCH BOARD
79306540
(pcb 2291057704)

SN 390896–up
compatible with
predecessors.

MAIN BOARD
79306530
(pcb 2291057704)





IC1 : LA6458S
IC2 : MBR1012-523
IC3 : LC7900
Q1,2 : 2SC945-P
Q3,4 : 2SK118-O
D1 : S5500G
D2 : RD6.8JB2
D3 : RD6.2JB2
D8 : MA27WB